



um usha martin

Usha Martin Group of Companies

Usha Martin Limited, set up at Ranchi in 1952 initially as Usha Martin Black, is an Indian multinational with corporate office in Calcutta and manufacturing facilities at UK, UAE, Thailand and India, is a thriving group with turnover exceeding 1500 crores (US \$ 350 million). The product range of Usha Martin includes speciality steel, its downstream products, IT/Telecom related products and services. Thanks to the superior quality of our products, we export 40% of all that we manufacture in India. What's more, the Usha Martin Group of Companies is currently the second largest steel wire rope manufacturer in the world. Our primary focus is the achievement of optimum customer satisfaction and it is indeed very gratifying that in an era, when customer is truly king, we have a contended and discerning customer base that is spread across the globe.

Usha Martin Ltd.
Wire & Wire Rope Division



Usha Martin Ltd.
Usha Alloys & Steels Division



Brunton Shaw, UK



Brunton Shaw,
Middle East



Usha Siam Steel,
Bangkok



Usha Breco Ltd.



UM Cables Limited



Usha martin Industries Ltd.
International Division



"IN OUR CHOSEN BUSINESSES,
WE SHALL RETAIN MARKET
LEADERSHIP IN INDIA. WE
SHALL BE GLOBALLY
COMPETITIVE THROUGH
CUSTOMER ORIENTATION AND
EXCELLENCE IN QUALITY,
INNOVATION AND
TECHNOLOGY."

Usha Martin Ltd.
Usha Ismal Division



Usha Martin Infrastructure
Service Ltd.



Usha Martin Ltd.
Machinery Division



Usha Comm India Ltd.
Software Division

Usha Ismal Division

During the year 1965, Usha Martin promoted a company named 'Indian Splicing and Mechanical Accessories Ltd.' in collaboration with C.C.L. Systems Ltd. of U.K., for manufacture Prestressing Equipment & Accessories, Wire Rope Splicing Equipment & Accessories, Hydraulic Crimping Tools, Electrical Fittings & Accessories, etc.. Subsequently, the name of this company was changed to Usha Ismal Ltd., ISMAL being the initials of the previous name of the company. Over the period of years, Usha Ismal Ltd. was merged with the parent company and became Usha Ismal Division of USHA MARTIN LIMITED. The factory of Usha Ismal Division is located at Ranchi, the capital of Jharkhand State, which is located about 400 kms away from Calcutta.

Prestressing Systems

For over two decades, Usha Martin Ltd., Usha Ismal Division, has been manufacturing & supplying prestressing products to all major construction companies in the country. Based on Gifford Udall System, these products have been used widely in Nuclear Reactors, Major River Bridges, Flyovers, Dams, Cement Silos, Stadiums and many other applications. Besides, indigenously developed rock anchors of Usha Ismal have been quite popular for construction in the difficult Himalayan terrain. Flat Anchorage & Sheathing used for construction of Post-Tensioned Slabs are also there in the product range of Usha Ismal.

During the last decade, Usha Ismal has established itself as the leading prestressing agency for execution of prestressing jobs. Some of the major prestressing contracts executed are listed below :



Prestressing contracts executed

Customer	Project	Client	Tonnage	Period
Afcons Infrastructure Ltd.	Sone River Bridge	Railways	1267	2004 - till now
Larsen & Toubro Ltd.	Cement Plant	Expansion Dalmia Cements	200	2004 - till now
Navayuga Engg. Co.Ltd.	NH 5 Four laning	NHAI	400	2002 - till now
Larsen & Toubro Ltd.	Vijaywada Flyover	Vijaywada Municipality	120	2004
Aluwallah Contracts Ltd.	DMRC job	DMRC	160	2003 - 2004
R.K.Engineers	NH-5 Four Laning	NHAI	100	2002 - 2003
R.K.Engineers	Birupa River Bridge	Railways	100	2002 - 2003
Larsen & Toubro Ltd.	Guwahati Flyover	PWD, Assam	195	2000 - 2001
Larsen & Toubro Ltd.	MRTS, Chennai	Railways	450	1999 - 2001
Larsen & Toubro Ltd.	Chennai Flyovers	Chennai Municipal Corporation	170	1999 - 2000
U.P.State Bridge Corpn.	Mahanadi River bridge	Orissa PWD	400	1998 - 2000
Afcons Infrastructure ltd.	Punjabi Bag Flyover, New Delhi	DDA	150	1996 - 1999
Afcons Infrastructure ltd.	Ashram Flyover, New Delhi	DDA	150	1999 - 2000



Prestressing Systems

POST-TENSIONING

Anchorage

Ismal anchorage comprise a cast iron tube unit, a forged steel bearing plate, and necessary numbers of hardened wedges for gripping of strands after stressing. These are tested to comply with the requirements of BS 4447:1973 and FIP recommendations:1993 and are manufactured to suit cables having 4 to 31 number strands in case of 12.7 mm strands and up to 19 nos. of 15.2 mm strands.

Flat anchorage used for post-tensioned slabs are manufactured to suit requirements of tendons of both 12.7 mm and 15.2 mm strands.

While standard anchorage are commonly used for live ends, dead end anchorage (for ends buried in concrete) and anchorage coupling (used in continuous spans) are also available.

Rock anchors are available for strand numbers in the tendon varying from 3 to 19 and are supplied along with necessary trumpets and other components.

Sheathing

Drossbatch type sheathing with internal diameter from 42 mm to 110 mm are manufactured with bright metal or galvanized CRCA steel strips in compliance with the requirements specified in IRC 18 - 2000 and MOST guidelines.

Flat sheathing used for post-tensioned slabs are manufactured to suit requirements of 4-strand or 5-strand tendons of both 12.7 mm and 15.2 mm strands.

Multipull & Single-Pull Jacks

Multipull hydraulic jacks with hydraulic lock-off facility for proper seating of wedges in bearing plates are manufactured for stressing cables with considerable ease of operation. Besides, Single Pulling jacks are also manufactured for both wire and strand applications. Details are furnished in the table below :



Anchorage



Sheathing



Multipull Jack

Model	Capacity (KN)	Overall length (Mm)	Outer size (mm)	Gripping	Grip length (mm)	Ram Area (sq.mm)	Max. Stroke (mm)	Weight (kg)
Multipull Jacks :								
1000 MG	1000	615	248	Mid	500	22940	200	110
1800 MG	1800	780	342	Mid	700	46860	210	280
4000 MG	4000	805	490	Mid	750	102570	210	540
5000 MG	5000	820	545	Mid	750	118750	210	640
Single Pull Jacks :								
J20	220	735	170	Front	350	4220	350	28
J20 Long	220	935	170	Front	350	4220	350	37
J30	300	735	220	Front	350	8022	350	48





Prestressing Systems

Hydraulic power operated pumps

These are rotary co-axial pumps, made in various models for use with multipull jacks as well as single pull jacks. While all are equipped with relief valves and pressure gauges, those used with multipull hydraulic jacks, are fitted with two direction control valves - one for stressing and another for lock off, and two pressure gauges for reading pressures during stressing as well as during lock off. The pumps used for single pulling application have one direction control valve and one pressure gauge only. Details of pumps are furnished in the table below:

Model	Power	No. of Piston	Max. pressure (Kg/sq.cm)	Discharge (ltr/min)	Tank capacity (ltr)	Approx. dimensions (mm)			Weight (kg)
						L	B	H	
VMP 3	3 ph. 440 V	3	450	2.25	40	710	485	520	155
VMP 5	3 ph. 440 V	5	450	9.50	90	980	606	600	210

Grout pump and agitator:

Positive displacement screw type rotary grout pumps with 1000 ltr/hr delivery, 3hp, 440 volt power requirement are manufactured for use in almost all grouting application of bonded tendons. Power operated grout agitators of different sizes are also manufactured for use during grouting along with the grout pumps.

PRE-TENSIONING

Grips:

Designed and developed on the basis of technical expertise and long experience, these grips comprise barrels and hardened wedges manufactured for both wire and strand. The halves or segments of the wedges of higher sizes are held together with wire circlip or rubber o'ring. These grips are available for wires/strands from 3 mm to 15.7 mm diameter and in ancarite as well as XL range depending on the type of use.

Wire Jacks:

These wire jacks are suitable for stressing wires up to 8 mm diameter and can be operated either with power operated or hand operated pumps. Details are furnished in the table below:

Model	Capacity (KN)	Overall length (mm)	Outer size (mm)	Gripping	Grip length (mm)	RamArea (sq.mm)	Max. Stroke (mm)	Weight (kg)
10"Wire Jack	65	610	130	Rear	700	1465	250	10
20"Wire Jack	65	915	130	Rear	1000	1465	500	15

Hand pump:

Small type P-5012 hand pump is a manually operated pump with a pressure gauge mounted on the stressing line exit for reading the pressure applied. For safety measure, a relief valve is provided in the pump.

Power operated pump:

Single DC Valve Pumps, mentioned under Post-Tensioning are used for pre-tensioning applications also.



BARGRIP SPlicing OF REINFORCEMENT BARS

Introduction :

Ismal Bargrip Splicing method of jointing reinforcement bars is suitable for all tension, compression and stress reversal applications and is a method of mechanical splicing of bars.. The ends of the bars to be jointed are inserted into a sleeve made of seamless steel tube and the sleeve is spliced onto the bars by a series of bites with the help of a specially designed hydraulic press fitted with dies to suit the diameter of the bar to be jointed. Standard Bargrip Splices are available for 16 mm to 45 mm dia reinforcement bars.

Features :

1. Reduces congestion and facilitates better flow of concrete since the diameter of the spliced joint is much less than the total space needed by the lapped joint.
2. No heat used as it is a cold process. Hence no stresses introduced.
3. No major bar end preparation needed as there is adequate margin. It is however always better that the bar end is not too jagged or cut as a taper or an extreme angle.
4. It behaves like a continuous bar. Tests in concrete beams show spliced bars have similar results as continuous ones.
5. The transverse reinforcement required to deal with bursting forces produced by counteraction of lapped bars can be omitted.
6. Expensive cranked bars can be omitted.
7. Easily checked visually by the shape achieved (octagonal) and elongation of the sleeve.
8. It can be used as a lightning conductor readily transmitting electric current. A lap joint is a poor conductor.
9. When used in underground tunnels and pipes it also takes care of the hoop stress in the round structure. The lap joint just cannot provide this and the only other option is welding which introduces stresses and may also not be feasible.

Testing & International codes :

Rigorous performance tests examining the tensile , flexural and fatigue behaviour of the Ismal bargrip Splicing system have been conducted at various laboratories such as IIT, Madras & Delhi, University of Roorkee etc. The system complies with the requirements of BS 8110, 4449 & 4461. It also meets US codes ACI-318 the Building Code; ACI-359 ASME Nuclear; ACI-349 Nuclear Design Code, Canadian Standards Association Nuclear Code CSA No.287.3. The New Zealand Ministry of Works and Development has approved use of Bargrip Splicing for use in seismic areas. It has been included in the HANDBOOK OF CONCRETE REINFORCEMENT AND DETAILING, published by the Bureau of Indian Standards and the INDIAN ROAD CONGRESS code IRC-21. It is also approved by RESEARCH DESIGNS & STANDARDS ORGANIZATION (RDSO) AND NUCLEAR POWER CORPORATION OF INDIA.



Projects :

Bargrip Splicing System has been widely used in various prestigious projects in India, viz., :

- | | |
|-----------------------------|---|
| Nuclear Power Plants | : Kalpakkam, Kaiga, Kota, Tarapur |
| Hydel Power Plants | : Ranjit Sagar Dam, Upper Indravati, North Koel Dam |
| Flyovers and bridges | : Vasai creek, Jogighopa, Richmond circle flyover (Bangalore) and various other bridges of NHAI, Railways, PWD etc. |
| Buildings | : US-Consulate - Calcutta, Taj Bengal Hotel - Calcutta, Hotel Leela Palace - Bangalore, Satya Sai Hospital - Bangalore. |



MECHANICAL SPLICING OF WIRE ROPES



Introduction :

The technology of mechanical splicing of wire ropes using hydraulic presses was brought to India by Usha Martin since the day of inception of ISMAL. With the range of products covering Hydraulic Presses, Swaging Dies, Aluminium Alloy Ferrules, which are swaged over the wire ropes, and Hydraulically Operated Proof Load Testing Machines for testing of wire rope slings, a complete system of safe, reliable and cost-effective wire rope splicing is available for the users.

Customers :

These products have been supplied to various Steel Plants, Port Trusts, Railways, Naval Dockyards, etc. and other Heavy Engineering Factories.

The range :

Hydraulic presses

Capacity (Tons)	Wire rope dia range (mm)
150	19
300	25
500	35
1000	52

Proof Load Testing machines : Available in 30Ton, 50 ton, 60 Ton and 100 Ton



1000 Ton Hydraulic Press



Swage Blocks & Ferrules

CERTIFICATES

LARSEN & TOUBRO LIMITED
ECC DIVISION
MEMBERED CONSTRUCTION & CONTRACTS

NAVAYUGA ENGINEERING COMPANY LTD
GEO-TECHNICAL AND CONSTRUCTION ENGINEERS

LARSEN & TOUBRO LIMITED
TO WHOM IT MAY CONCERN

INDUSTRIES - USHA (ISMAL DIVISION) KOLKATA
DIVISION OF USHA BELTRON LTD, GUWAHATI

UTTAR PRADESH STATE BRIDE CORP LTD.
(A STATE GOVERNMENT UNDERTAKING)

BHAGHEERATHA ENGINEERING LIMITED
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Essa Engineering & Marine Services

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TO WHOMSOEVER IT MAY CONCERN

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